

WHAT IS CLAIMED is:

1. A cooling system for a fuel cell powered vehicle wherein a fuel cell is mounted as a power source of an electric vehicle motor, the cooling system comprising:

a primary circulation passage arranged to allow primary coolant to be circulated through a primary circulation pump to cool the fuel cell;

a secondary circulation passage arranged to circulate secondary coolant through a secondary circulation pump;

a primary heat exchanger for achieving heat exchange between the primary coolant and the secondary coolant; and

a secondary heat exchanger for achieving heat exchange between the secondary coolant and the flow of outside air;

wherein the primary and secondary circulation pumps are connected to and driven with rotatable shafts of a single pump drive motor, respectively.

2. A cooling system according to claim 1, wherein a mutual ratio of flow rates of the primary and secondary circulation pumps is determined independence on characteristics of the primary coolant, the secondary coolant and a heat discharging capacity of the secondary heat exchanger.

3. A cooling system for a fuel cell powered vehicle having a fuel cell serving as a power source for propelling an electric vehicle

motor, the cooling system comprising:

a primary circulation passage connected to the fuel cell and including a primary circulation pump for circulating primary coolant in the primary circulation passage to maintain the temperature of the fuel cell at a given temperature;

a first heat exchanger having first and second flow passages, with the first flow passage being located in the primary circulation passage;

a secondary circulation passage connected to a heat generating source composed of at least the electric vehicle motor and including a secondary circulation pump for circulating secondary coolant in the secondary circulation passage, with the secondary circulation passage being located in the second flow passage of the first heat exchanger to achieve heat exchange between the primary coolant and the secondary coolant; and

a single pump drive motor including rotatable shafts connected to and drive the primary and secondary circulation pumps, respectively.

4. A cooling system according to claim 3, further comprising a second heat exchanger located in the secondary circulation passage to achieve heat exchange between the secondary coolant and the flow of outside air.

5. A cooling system according to claim 4, wherein the secondary circulation passage includes a main circulation flow passage for

circulating the secondary coolant through the secondary circulation pump, the first heat exchanger and the second heat exchanger, and a sub-circulation flow passage for circulating the secondary coolant through the secondary circulation pump, the heat generating source and the second heat exchanger.

6. A cooling system according to claim 5, further comprising a third heat exchanger located in the sub-circulation flow passage to achieve heat exchange between the secondary coolant and the flow of outside air.

7. A cooling system according to claim 3, wherein a mutual ratio of flow rates of the primary and secondary circulation pumps is determined in dependence on characteristics of the primary coolant, the secondary coolant and a heat discharging capacity of the second heat exchanger.

8. A fuel cell powered vehicle comprising:

a fuel cell serving as a power source;

an electric vehicle motor powered by the fuel cell for propelling the vehicle;

a primary circulation passage connected to the fuel cell and including a primary circulation pump for circulating primary coolant in the primary circulation passage to maintain the temperature of the fuel cell at a given temperature;

a first heat exchanger having first and second flow passages,

with the first flow passage being located in the primary circulation passage;

a secondary circulation passage connected to a heat generating source composed of at least the electric vehicle motor and including
5 a secondary circulation pump for circulating secondary coolant in the secondary circulation passage, with the secondary circulation passage being located in the second flow passage of the first heat exchanger to achieve heat exchange between the primary coolant and the secondary coolant; and

10 a single pump drive motor including rotatable shafts connected to and drive the primary and secondary circulation pumps, respectively.

9. A fuel cell powered vehicle according to claim 8, further
15 comprising a second heat exchanger located in the secondary circulation passage to achieve heat exchange between the secondary coolant and the flow of outside air.

10. A fuel cell powered vehicle according to claim 9, wherein
20 the secondary circulation passage includes a main circulation flow passage for circulating the secondary coolant through the secondary circulation pump, the first heat exchanger and the second heat exchanger, and a sub-circulation flow passage for circulating the secondary coolant through the secondary circulation pump, the heat
25 generating source and the second heat exchanger.

11. A fuel cell powered vehicle according to claim 10, further comprising a third heat exchanger located in the sub-circulation flow passage to achieve heat exchange between the secondary coolant and the flow of outside air.

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12. A fuel cell powered vehicle according to claim 8, wherein a mutual ratio of flow rates of the primary and secondary circulation pumps is determined in dependence on characteristics of the primary coolant, the secondary coolant and a heat discharging capacity of the second heat exchanger.

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13. A fuel cell powered vehicle according to claim 10, further comprising an intercooler for supplying air to the fuel cell and located in the main circulation flow passage of the secondary circulation passage.

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14. A fuel cell powered vehicle according to claim 10, further comprising a supercharger for supplying air to the fuel cell, a power drive unit and a drive motor connected to the supercharger, with both the power drive unit and the drive motor of the supercharger being located in the sub-circulation flow passage of the secondary circulation passage and cooled with the secondary coolant.

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